Drinking Water Surveillance Program

STOUFFVILLE WELL SUPPLY SYSTEM

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STOUFFVILLE
WELL SUPPLY SYSTEM

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1988

FEBRUARY 1990

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

STOUFFVILLE WELL SUPPLY
1988 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The Stouffville Water Supply is a groundwater source and consists of three wells. Wells 5 and 6 feed two interconnected reservoirs from which water is subsequently pumped to the distribution system and the Stouffville water tower. Well 3 has been brought into use during periods of high water demand only. The only treatment process applied is chlorination. Chlorine is added at the reservoir.

Water samples were taken on a monthly basis at Well 5, Well 6 and the reservoir. The Stouffville Well Supply was sampled, for approximately 160 parameters, monthly during 1988. Parameters were divided into the following groups: Bacteriological, Inorganic and Physical (Laboratory Chemistry, Field Chemistry and Metals) and Organic (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles). Chlorophenols and Specific Pesticides were analysed for in June and November only.

A summary of results is shown in Table 1.

Inorganic and Physical parameters were below any applicable health related ODWOs.

Of a total of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

During 1988 the DWSP sampling results indicated that the Stouffville Well Supply System produced good quality water.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY

SUMMARY TABLE BY SCAN (1988)

SCAN	RAW 6 TESTS	RAW 6 POSITIVE	RAW 6 %POSITIVE	RAW 5 TESTS	RAW 5 POSITIVE	RAW 5 %POSITIVE	TREATED TESTS	TREATED POSITIVE	TREATED %POSITIVE
BACTERIOLOGICAL	48	8	16	48	8	16	47	7	14
CHEMISTRY (FLD)	26	26	100	27	27	100	63	63	100
CHEMISTRY (LAB)	266	178	66	266	169	63	266	163	61
METALS	312	115	36	312	106	33	312	105	33
CHLOROAROMATICS	168	0	0	182	0	0	182	0	0
CHLOROPHENOLS	12	0	0	12	0	0	12	0	0
PAH	221	0	0	221	0	0	221	0	0
PESTICIDES & PCB	394	0	0	428	0	0	428	0	0
PHENOLICS	13	0	0	13	0	0	13	1	7
SPECIFIC PESTICIDES	57	0	0	57	0	0	56	0	0
VOLATILES	258	0	0	257	0	0	258	38	14
TOTAL	1775	327		1823	310		1858	377	

NO HEALTH RELATED GUIDELINES WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

STOUFFVILLE WELL SUPPLY 1988
ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The DWSP was initiated in Stouffville in the spring of 1987. An Annual Report was published for 1987 (ISSN 0840-5301).

This report contains information and results for 1988.

PLANT DESCRIPTION

The Stouffville Well Supply is a groundwater source and consists of three wells. Wells 5 and 6 feed two interconnected reservoirs from which water is subsequently p mped to the distribution system and the Stouffville water tower. Well 3 has been brought into use during periods of high water demand only. The water in the reservoir is chlorinated prior to distribution to the consumer. The DWSP samples raw water from Well 5 and Well 6 and treated water

from the reservoir.

The Stouffville Water Supply serves a population of approximately 14,400 people. The treated reservoir has daily flows ranging from 1.6 x 1000m3/day to 4.9 x 1000m3/day.

The location is shown in Figure 1. General information is presented in Table 2.

METHODS

Water samples were obtained from three DWSP approved locations;

i) Raw Well #5 - The water originated from the pump discharge line prior to chlorination and was sampled through a stainless steel line. The sample tap is located by the pump.

ii) Raw Well #6 - The water originated from the pump discharge and was sampled through a stainless steel line. The sample tap is located by the pump.

iii) Treated - The water originated from the highlift pump discharge and was sampled through a stainless steel line. The sample tap is located by the highlift pump.

All sample lines were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM

SITE LOCATION MAP

STOUFFVILLE WATER SUPPLY

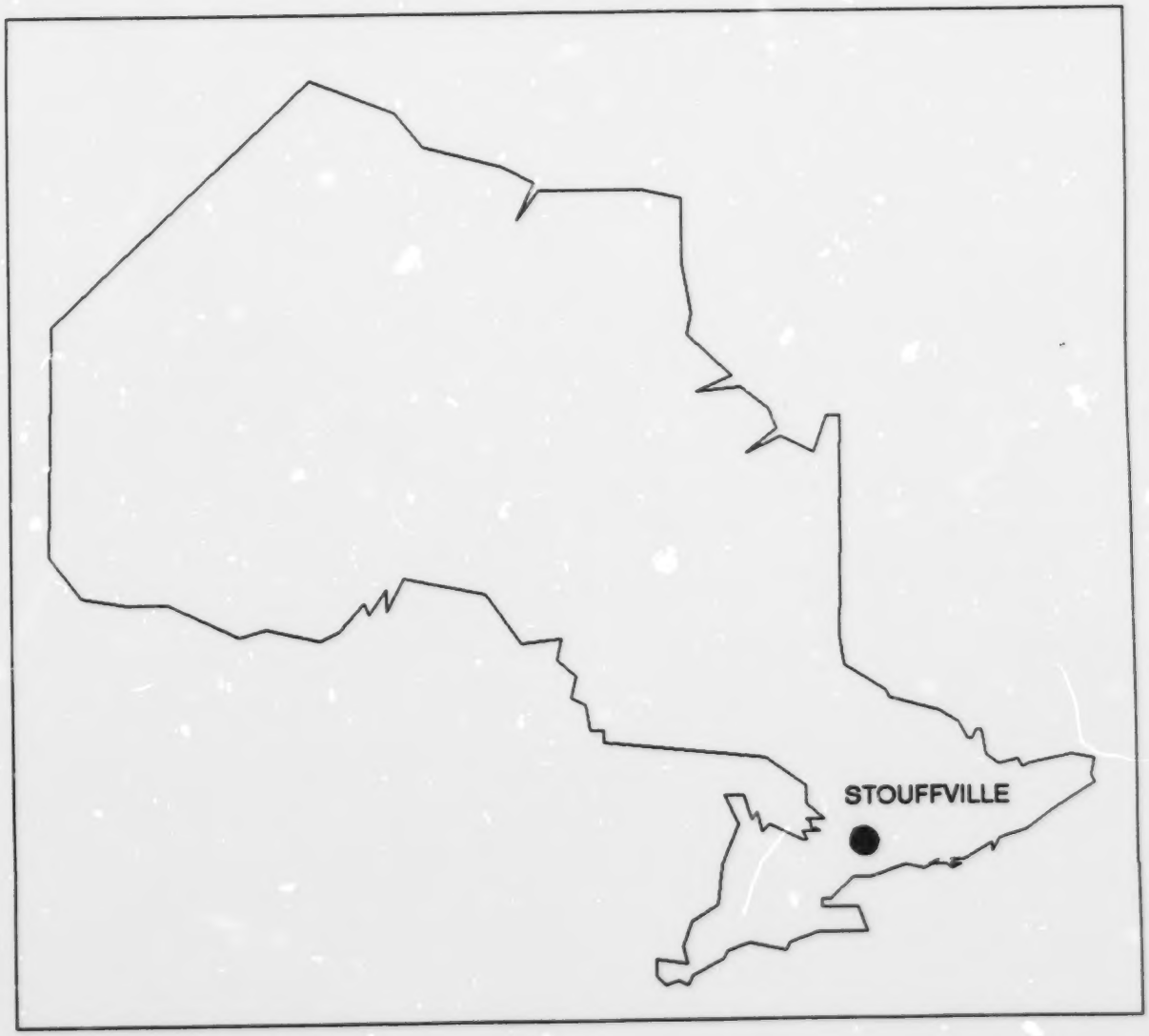

TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

STOUFFVILLE WELL SUPPLY

LOCATION:	STOUFFVILLE, ONTARIO
SOURCE:	RAW WATER SOURCE - GROUND WATER
RATED CAPACITY:	1.19 (1000 M3/DAY)
OPERATION:	REGIONAL MUNICIPALITY OF YORK
TECNICAL SUPERINTENDENT:	J. SIBBALD
MINISTRY REGION:	CENTRAL
MOE CONTACT:	W. MAITLAND

MUNICIPALITY SERVED	POPULATION
TOWN OF STOUFFVILLE	5,500

standing in the sample line.

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in a uniform manner.

Sample day flow, treatment chemical dosages and field measurements such as Turbidity, Chlorine Residuals, pH and Temperature were recorded on the day of sampling and were entered onto the DWSP data base as submitted.

RESULTS

The Stouffville Well Supply locations were sampled for approximately 160 parameters on a monthly basis in 1988. The Specific Pesticides and Chlorophenols scans were sampled for in June and November only. As a result of an unforeseen emergency the laboratory capacity was exceeded and analysis for volatiles could not be carried out when the samples were received. Since analysis for volatiles is no longer valid after four weeks of storage, volatile results for January, February and March are not available.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed for by parameter and by water type. The number of times

that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analysed in the DWSP.

Associated guidelines and detection limits are also supplied on both tables. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other

agencies are consulted. The Parameters Listing System (PALIS) recently published (ISBN 0-7729-4461-X) by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

Although some of the parameters measured on DWSP may be present in the raw and treated water as a result of pollution, many of the compounds detected are naturally occuring or are treatment by-products.

Plant operational personnel address occurrences of taste and odour or biological water quality parameters. The DWSP does not assess these aspects of the water supply.

As stated under Results, traces do not indicate quantifiable results as defined by established MOE laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. **DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.**

Bacteriology

Positive results for the Bacteriology scan were present seven times

in the treated water. In all cases, the positive parameters were Standard Plate Count.

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality; the routine monitoring program usually requires the taking of multiple samples in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Further, bacteriological limits were developed in acknowledgement that the presence of coliforms may be detected due to their non-uniform distribution throughout the distribution system and the fact that their enumeration is subject to considerable variation. Routine bacteriological monitoring, as outlined in the ODWOs is carried out by the operating authority.

Inorganic and Physical

Laboratory and Field Chemistry

The results for the Laboratory Chemistry and Field Chemistry scans were below any applicable health related ODWOs.

The ODWO recommend a hardness level of between 80 and 100 mg/L as calcium carbonate ($CaCO_3$) for domestic waters, to provide an acceptable balance between corrosion and incrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and would possess a tendency to form scale deposits and result in

excessive soap consumption. The two well sources and water from the reservoir had hardness values above 200 mg/L as CaCO3.

Some European Economic Community (EEC) guidelines for parameters related to hardness ie. Conductivity were also exceeded in all samples as a result of the high hardness levels.

The Langelier Index is used extensively in estimating the corrosion potential of water. An increasingly negative index indicates the increasing possibility of corrosion. It is considered sound engineering practice to maintain a slightly positive Langelier Index. The Langelier Index for the Stouffville water is consistently positive.

Metals

The results reported for the Metals scan were all below any applicable health related ODWOs.

Organic Parameters

Chloroaromatics

The results of the Chloroaromatics scan showed that no chloroaromatics were detected.

Chlorophenols

The results of the Chlorophenols scan showed that no chlorophenols

were detected.

Pesticides and PCB (Polychlorinated Biphenyls)

The results of the Pesticides and PCB scan showed that no Pesticides or PCBs were detected.

Specific Pesticides

Results of the Specific Pesticides scan showed that no Specific Pesticides were detected.

Phenolics

The maximum desirable concentration of phenolic substances in drinking water is 2.0 ug/L. This limit has been set primarily to prevent the occurrence of undesirable tastes and odours, particularly in chlorinated water. Phenolics were detected at trace levels, four times in the raw well #5 water and the raw well #6 water and three times in the treated water. Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes.

Polynuclear Aromatic Hydrocarbons (PAHs)

The results of the PAH scan showed that no PAHs were detected.

Volatiles

The results of the Volatiles scan showed that seven parameters, other than Trihalomethanes(THMs), were detected:

Toluene

Ethylbenzene

Meta-Xylene

Ortho-Xylene

Styrene

1,1,1-Trichloroethane

Tetrachloroethylene

Toluene was detected at trace levels, twice in the raw well #5 water and once in the raw well #6 water. The laboratory extraction procedure for volatiles consists of passing a helium extract of the water through a TENEX column prior to gas chromatography analysis. Experience has shown that several contaminants may be contributed to samples from the column itself. If a blank (water of guaranteed purity) passed through the column indicates a background level of Toluene, then all subsequent extractions are considered to be unreliable. Similar considerations apply in the analysis of styrene. All occurences of Toluene and Styrene were considered by laboratory staff to be unreliable.

Ethylbenzene was detected at trace levels, four times in the raw well 5 water, seven times in the raw well 6 water and six times in the treated water.

Meta-Xylene (M-Xylene) was detected at trace levels, once in the raw well #5 water and raw well #6 water and twice in the treated

water.

Ortho-Xylene (O-Xylene) was detected at trace levels, once in the raw well #6 water and three times in the treated water.

The volatiles listed above are typically found on an occasional basis at other water supplies included on the DWSP usually at trace levels.

1,1,1-Trichloroethane was detected at a trace level, once in the raw well #6 water.

Tetrachloroethylene (T-Chloroethylene) was detected at 0.65 ug/L in the August treated water sample and 0.80 ug/L in the September treated water sample. These values are below the World Health Organization's (WHO) tentative guideline value for tetrachloroethylene in drinking water of 10.0 ug/l. It was also detected at trace levels, three times in the raw wells #5 and #6 and once in the treated water.

THMs are acknowledged to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised of Chloroform, Chlorodibromomethane and Dichlorobromomethane. Bromoform occurrs occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Chlorodibromomethane and Dichlorobromomethane were detected in all treated water samples. Bromoform was detected at trace levels in all treated water samples.

All Total THM occurrences, ranging from 11.7 ug/l to 28.3 ug/l, were well below the ODWO of 350 ug/L.

CONCLUSIONS

The Stouffville Well Supply for the sample year of 1988 was of good quality.

No health related guidelines, for organic or inorganic parameters, were exceeded during 1988.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY SAMPLE DAY CONDITIONS FOR 1988

SAMPLE DAY CONDITIONS			TREATMENT CHEMICAL DOSAGES (MG/L)
DATE	RETENTION TIME(HRS)	FLOW (1000 M3)	POST-CHLORINATION CHLORINE
JAN 21	24.0	2.4	00.91
FEB 16	24.0	3.4	00.66
MAR 22	24.0	3.3	00.85
APR 18	24.0	3.4	00.88
APR 26	24.0	3.8	01.20
MAY 17	24.0	2.2	01.26
JUN 21	24.0	4.9	01.07
JUL 19	24.0	3.5	00.88
AUG 16	24.0	1.6	00.91
SEP 20	24.0	3.8	01.20
OCT 18	24.0	3.1	00.94
NOV 22	24.0	2.6	00.97
DEC 13	24.0	3.6	01.01

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6 TOTAL	RAW 6 POSITIVE	RAW 6 TRACE	RAW 5 TOTAL	RAW 5 POSITIVE	RAW 5 TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
BACTERIOLOGICAL	FECAL COLIFORM MF	13	0	0	13	0	0	.	.	.
	STANDRD PLATE CNT MF	9	7	0	9	8	0	12	7	0
	P/A BOTTLE	.	.	.	.	.	.	9	0	0
	TOTAL COLIFORM MF	13	0	0	13	0	0	13	0	0
	T COLIFORM BCKGRD MF	13	1	0	13	0	0	13	0	0
*TOTAL SCAN BACTERIOLOGICAL		48	8	0	48	8	0	47	7	0
*TOTAL GROUP BACTERIOLOGICAL		48	8	0	48	8	0	47	7	0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	.	.	.	.	10	10	0
	FLD CHLORINE FREE	.	.	.	.	.	.	13	13	0
	FLD CHLORINE (TOTAL)	.	.	.	.	.	.	13	13	0
	FLD PH	13	13	0	13	13	0	13	13	0
	FLD TEMPERATURE	13	13	0	13	13	0	13	13	0
	FLD TURBIDITY	.	.	.	1	1	0	1	1	0
*TOTAL SCAN CHEMISTRY (FLD)		26	26	0	27	27	0	63	63	0
CHEMISTRY (LAB)	ALKALINITY	13	13	0	13	13	0	13	13	0
	CALCIUM	13	13	0	13	13	0	13	13	0
	CYANIDE	13	0	0	13	0	0	13	0	0
	CHLORIDE	13	13	0	13	13	0	13	13	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6 TOTAL	RAW 6 POSITIVE	RAW 6 TRACE	RAW 5 TOTAL	RAW 5 POSITIVE	RAW 5 TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
CHEMISTRY (LAB)	COLOUR	13	0	10	13	0	7	13	1	2
	CONDUCTIVITY	13	13	0	13	13	0	13	13	0
	FLUORIDE	13	10	3	13	7	6	13	9	4
	HARDNESS	13	13	0	13	13	0	13	13	0
	IONCAL	13	6	0	13	6	0	13	6	0
	LANGELIERS INDEX	13	13	0	13	13	0	13	13	0
	MAGNESIUM	13	13	0	13	13	0	13	13	0
	SODIUM	13	13	0	13	13	0	13	13	0
	AMMONIUM TOTAL	13	7	5	13	5	8	13	3	6
	NITRITE	13	7	6	13	4	8	13	0	2
	TOTAL NITRATES	13	13	0	13	13	0	13	13	0
	NITROGEN TOT KJELD	13	2	11	13	2	11	13	0	13
	PH	13	13	0	13	13	0	13	13	0
	PHOSPHORUS FIL REACT	13	3	9	13	0	11	13	1	11
	PHOSPHORUS TOTAL	13	0	3	13	0	1	13	0	2
	SULPHATE	6	6	0	6	6	0	6	6	0
	TURBIDITY	13	7	6	13	9	4	13	7	6
*TOTAL SCAN CHEMISTRY (LAB)		266	178	53	266	169	56	266	163	46
METALS	SILVER	13	0	4	13	0	7	13	0	5
	ALUMINUM	13	13	0	13	13	0	13	13	0
	ARSENIC	13	0	7	13	0	9	13	0	9

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6			RAW 5			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	BARIUM	13	13	0	13	13	0	13	13	0
	BORON	13	5	8	13	4	9	13	3	10
	BERYLLIUM	13	0	7	13	0	6	13	0	6
	CADMIUM	13	0	0	13	0	2	13	0	0
	COBALT	13	0	11	13	0	8	13	0	9
	CHROMIUM	13	6	7	13	5	7	13	6	7
	COPPER	13	1	12	13	0	13	13	2	11
	IRON	13	0	3	13	0	3	13	0	4
	MERCURY	13	5	2	13	5	2	13	5	2
	MANGANESE	13	10	2	13	10	3	13	8	5
	MOLYBDENUM	13	10	3	13	1	12	13	5	8
	NICKEL	13	1	4	13	2	4	13	0	3
	LEAD	13	0	8	13	0	11	13	0	8
	ANTIMONY	13	4	4	13	4	6	13	4	3
	SELENIUM	13	0	9	13	0	11	13	0	12
	STRONTIUM	13	13	0	13	13	0	13	13	0
	TITANIUM	13	13	0	13	13	0	13	13	0
	THALLIUM	13	0	5	13	0	5	13	0	4
	URANIUM	13	13	0	13	13	0	13	13	0
	VANADIUM	13	0	13	13	0	13	13	0	13
	ZINC	13	8	5	13	10	3	13	7	6
*TOTAL SCAN METALS		312	115	114	312	106	134	312	105	125
*TOTAL GROUP INORGANIC & PHYSICAL		604	319	167	605	302	190	641	331	171

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6 TOTAL	RAW 6 POSITIVE	RAW 6 TRACE	RAW 5 TOTAL	RAW 5 POSITIVE	RAW 5 TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
CHLOROAROMATICS	HEXACHLOROBUTADIENE	12	0	0	13	0	0	13	0	0
	123 TRICHLOROBENZENE	12	0	0	13	0	0	13	0	0
	1234 T-CHLOROBENZENE	12	0	0	13	0	0	13	0	0
	1235 T-CHLOROBENZENE	12	0	0	13	0	0	13	0	0
	124 TRICHLOROBENZENE	12	0	0	13	0	0	13	0	0
	1245 T-CHLOROBENZENE	12	0	0	13	0	0	13	0	0
	135 TRICHLOROBENZENE	12	0	0	13	0	0	13	0	0
	HCB	12	0	0	13	0	0	13	0	0
	HEXACHLOROETHANE	12	0	0	13	0	0	13	0	0
	OCTACHLOROSTYRENE	12	0	0	13	0	0	13	0	0
	PENTACHLOROBENZENE	12	0	0	13	0	0	13	0	0
	236 TRICHLOROTOLUENE	12	0	0	13	0	0	13	0	0
	245 TRICHLOROTOLUENE	12	0	0	13	0	0	13	0	0
	26A TRICHLOROTOLUENE	12	0	0	13	0	0	13	0	0
*TOTAL SCAN CHLOROAROMATICS		168	0	0	182	0	0	182	0	0
CHLOROPHENOLS	234 TRICHLOROPHENOL	2	0	0	2	0	0	2	0	0
	2345 T-CHLOROPHENOL	2	0	0	2	0	0	2	0	0
	2356 T-CHLOROPHENOL	2	0	0	2	0	0	2	0	0
	245-TRICHLOROPHENOL	2	0	0	2	0	0	2	0	0
	246-TRICHLOROPHENOL	2	0	0	2	0	0	2	0	0
	PENTACHLOROPHENOL	2	0	0	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6 TOTAL	RAW 6 POSITIVE	RAW 6 TRACE	RAW 5 TOTAL	RAW 5 POSITIVE	RAW 5 TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
*TOTAL SCAN CHLOROPHENOLS		12	0	0	12	0	0	12	0	0
PAH	PHENANTHRENE	13	0	0	13	0	0	13	0	0
	ANTHRACENE	13	0	0	13	0	0	13	0	0
	FLUORANTHENE	13	0	0	13	0	0	13	0	0
	PYRENE	13	0	0	13	0	0	13	0	0
	BENZO(A)ANTHRACENE	13	0	0	13	0	0	13	0	0
	CHRYSENE	13	0	0	13	0	0	13	0	0
	DIMETH. BENZ(A)ANTHR	13	0	0	13	0	0	13	0	0
	BENZO(E) PYRENE	13	0	0	13	0	0	13	0	0
	BENZO(J) FLUORANTHEN	0	0	0	0	0	0	0	0	0
	BENZO(B) FLUORANTHEN	13	0	0	13	0	0	13	0	0
	PERYLENE	13	0	0	13	0	0	13	0	0
	BENZO(K) FLUORANTHEN	13	0	0	13	0	0	13	0	0
	BENZO(A) PYRENE	13	0	0	13	0	0	13	0	0
	BENZO(G,H,I) PERYLEN	13	0	0	13	0	0	13	0	0
	DIBENZO(A,H) ANTHRAC	13	0	0	13	0	0	13	0	0
	INDENO(1,2,3-C,D) PY	13	0	0	13	0	0	13	0	0
	BENZO(B) CHRYSENE	13	0	0	13	0	0	13	0	0
	ANTHANTHRENE	0	0	0	0	0	0	0	0	0
	CORONENE	13	0	0	13	0	0	13	0	0
*TOTAL SCAN PAH		221	0	0	221	0	0	221	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6			RAW 5			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	ALDRIN	12	0	0	13	0	0	13	0	0
	ALPHA BHC	12	0	0	13	0	0	13	0	0
	BETA BHC	12	0	0	13	0	0	13	0	0
	LINDANE	12	0	0	13	0	0	13	0	0
	ALPHA CHLORDANE	12	0	0	13	0	0	13	0	0
	GAMMA CHLORDANE	12	0	0	13	0	0	13	0	0
	DIELDRIN	12	0	0	13	0	0	13	0	0
	METHOXYCHLOR	12	0	0	13	0	0	13	0	0
	ENDOSULFAN 1	12	0	0	13	0	0	13	0	0
	ENDOSULFAN II	12	0	0	13	0	0	13	0	0
	ENDRIN	12	0	0	13	0	0	13	0	0
	ENDOSULFAN SULPHATE	12	0	0	13	0	0	13	0	0
	HEPTACHLOR EPOXIDE	12	0	0	13	0	0	13	0	0
	HEPTACHLOR	12	0	0	13	0	0	13	0	0
	MIREX	12	0	0	13	0	0	13	0	0
	OXYCHLORDANE	12	0	0	13	0	0	13	0	0
	OPDDT	12	0	0	13	0	0	13	0	0
	PCB	12	0	0	13	0	0	13	0	0
	DDD	12	0	0	13	0	0	13	0	0
	PPDDE	12	0	0	13	0	0	13	0	0
	PPDDT	12	0	0	13	0	0	13	0	0
	AMETRINE	12	0	0	13	0	0	13	0	0
	ATRAZINE	12	0	0	13	0	0	13	0	0
	ATRATONE	12	0	0	13	0	0	13	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6 TOTAL	RAW 6 POSITIVE	RAW 6 TRACE	RAW 5 TOTAL	RAW 5 POSITIVE	RAW 5 TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
PESTICIDES & PCB	CYANAZINE	12	0	0	13	0	0	13	0	0
	DES ETHYL ATRAZINE	5	0	0	6	0	0	6	0	0
	DES ETHYL SIMAZINE	5	0	0	6	0	0	6	0	0
	PROMETONE	12	0	0	13	0	0	13	0	0
	PROPAZINE	12	0	0	13	0	0	13	0	0
	PROMETRYNE	12	0	0	13	0	0	13	0	0
	METRIBUZIN	12	0	0	13	0	0	13	0	0
	SIMAZINE	12	0	0	13	0	0	13	0	0
	ALACHLOR	12	0	0	13	0	0	13	0	0
	METOLACHLOR	12	0	0	13	0	0	13	0	0
*TOTAL SCAN PESTICIDES & PCB		394	0	0	428	0	0	428	0	0
PHENOLICS	PHENOLICS	13	0	4	13	0	4	13	1	3
*TOTAL SCAN PHENOLICS		13	0	4	13	0	4	13	1	3
SPECIFIC PESTICIDES	TOXAPHENE	1	0	0	1	0	0	0	0	0
	2,4,5-T	2	0	0	2	0	0	2	0	0
	2,4-D	2	0	0	2	0	0	2	0	0
	24DCHLRPHENOXYBUTYRC	2	0	0	2	0	0	2	0	0
	2,4 D PROPIONIC ACID	2	0	0	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6			RAW 5			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	DICAMBA	2	0	0	2	0	0	2	0	0
	PICHLORAM	0	0	0	0	0	0	0	0	0
	SILVEX	2	0	0	2	0	0	2	0	0
	DIAZINON	2	0	0	2	0	0	2	0	0
	DICHLOROVOS	2	0	0	2	0	0	2	0	0
	CHLORPYRIFOS	2	0	0	2	0	0	2	0	0
	ETHION	2	0	0	2	0	0	2	0	0
	AZINPHOS-METHYL	0	0	0	0	0	0	0	0	0
	MALATHION	2	0	0	2	0	0	2	0	0
	MEVINPHOS	2	0	0	2	0	0	2	0	0
	METHYL PARATHION	2	0	0	2	0	0	2	0	0
	METHYLTRITHION	2	0	0	2	0	0	2	0	0
	PARATHION	2	0	0	2	0	0	2	0	0
	PHORATE	2	0	0	2	0	0	2	0	0
	RELDAN	2	0	0	2	0	0	2	0	0
	RONNEL	2	0	0	2	0	0	2	0	0
	AMINOCARB	0	0	0	0	0	0	0	0	0
	BENOMYL	2	0	0	2	0	0	2	0	0
	BUX	2	0	0	2	0	0	2	0	0
	CARBOFURAN	2	0	0	2	0	0	2	0	0
	CICP	2	0	0	2	0	0	2	0	0
	DIALLATE	2	0	0	2	0	0	2	0	0
	EPTAM	2	0	0	2	0	0	2	0	0
	IPC	2	0	0	2	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6			RAW 5			TREATED		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	PROPOXUR	2	0	0	2	0	0	2	0	0
	CARBARYL	2	0	0	2	0	0	2	0	0
	BUTYLATE	2	0	0	2	0	0	2	0	0
*TOTAL SCAN SPECIFIC PESTICIDES		57	0	0	57	0	0	56	0	0
VOLATILES	BENZENE	9	0	0	9	0	0	9	0	0
	TOLUENE	9	0	1	9	0	2	9	0	0
	ETHYLBENZENE	9	0	7	9	0	4	9	0	6
	P-XYLENE	9	0	0	8	0	0	9	0	0
	M-XYLENE	9	0	1	9	0	1	9	0	2
	O-XYLENE	9	0	1	9	0	0	9	0	3
	STYRENE	3	0	3	3	0	3	3	0	0
	1,1 DICHLOROETHYLENE	9	0	0	9	0	0	9	0	0
	METHYLENE CHLORIDE	9	0	0	9	0	0	9	0	0
	T1,2DICHLOROETHYLENE	9	0	0	9	0	0	9	0	0
	1,1 DICHLOROETHANE	9	0	0	9	0	0	9	0	0
	CHLOROFORM	9	0	1	9	0	0	9	9	0
	111, TRICHLOROETHANE	9	0	1	9	0	0	9	0	0
	1,2 DICHLOROETHANE	9	0	0	9	0	0	9	0	0
	CARBON TETRACHLORIDE	9	0	0	9	0	0	9	0	0
	1,2 DICHLOROPROPANE	9	0	0	9	0	0	9	0	0
	TRICHLOROETHYLENE	9	0	0	9	0	0	9	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW 6 TOTAL	RAW 6 POSITIVE	RAW 6 TRACE	RAW 5 TOTAL	RAW 5 POSITIVE	RAW 5 TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
VOLATILES	DICHLOROBROMOMETHANE	9	0	1	9	0	0	9	9	0
	112 TRICHLOROETHANE	9	0	0	9	0	0	9	0	0
	CHLORODIBROMOMETHANE	9	0	0	9	0	0	9	9	0
	T-CHLOROETHYLENE	9	0	3	9	0	3	9	2	1
	BROMOFORM	9	0	0	9	0	0	9	0	9
	1122 T-CHLOROETHANE	9	0	0	9	0	0	9	0	0
	CHLOROBENZENE	9	0	0	9	0	0	9	0	0
	1,4 DICHLOROBENZENE	9	0	0	9	0	0	9	0	0
	1,3 DICHLOROBENZENE	9	0	0	9	0	0	9	0	0
	1,2 DICHLOROBENZENE	9	0	0	9	0	0	9	0	0
	TRIFLUOROCHLOROTOLUE	3	0	0	3	0	0	3	0	0
	ETHLYENE DIBROMIDE	9	0	0	9	0	0	9	0	0
	TOTL TRIHALOMETHANES	9	0	0	9	0	0	9	9	0
*TOTAL SCAN VOLATILES		258	0	19	257	0	13	258	38	21
*TOTAL GROUP ORGANIC		1123	0	23	1170	0	17	1170	39	24
TOTAL		1775	327	190	1823	310	207	1858	377	195

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
1*. MAC for Bacteriological Analyses
Poor water quality is indicated when :
- total coliform counts > 0 < 5
- P/A Bottle Test is present after 48 hours
- Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
- Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
- Standard Plate Count should not exceed 500 organisms per ml at 35 ^{0}C within 48 hours

2. Interim Maximum Acceptable Concentration (IMAC)
3. Maximum Desirable Concentration (MDC)
4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.

B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO) (for xylenes, the AO is a total)

C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

H USSR MAXIMUM PERMISSIBLE CONCENTRATION

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

INTERPRETATION OF DATA

The interpretation of analytical results that are obtained from measurements near the limit of detection of the measurement process is subject to greater uncertainty than those at higher concentrations. The principle areas of concern relate to whether the substance has actually been detected, whether it has been properly identified, and whether it is an artifact of the measurement process. In other words, false positives can be caused by the instrumentation or the test procedures used, when in fact these compounds are not present in the sample.

There are several methods to treat data from such measurements:
1. Exclude the low-level data because of this uncertainty factor. However, studies of long-term environmental trends and modelling may be adversely affected by exclusion of such data.
2. Qualify these data so the user is aware of the greater uncertainty associated with their use.

For the Drinking Water Surveillance Program, measurements near the limit of detection of the measurement process are reported qualified by the code "<T". Results quantified by "W" indicate a zero measurement. These results are reported for purposes of modelling and long-term trend analysis and no significance should be attributed to a single determination of a substance below "T" (a single determination may well be a false positive). Repeat analysis or additional data are needed before it can be stated with certainty that the substance in question was truly present. On the other hand, it is less likely that repeated detection of a substance at or near the limit of detection at a specific location is solely due to an artifact in the measurement system, and more likely represents a true positive. However the average of such data is still only an estimate of the amount of substance present subject to the possible biases of the method used.

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident

!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours
T# (T06)	Result Taken After # Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 0 (A1)
JAN	0	0	.	
FEB	0	0	.	
MAR	0	0	.	
APR	0	0	.	
MAY	0	0	.	
JUN	0	0	.	
JUL	0	0	.	
AUG	0	0	.	
SEP	0 T06	0 T06	.	
OCT	0 T24	0 T24	.	
NOV	0 T48	0 T24	.	
DEC	0 T06	0 T06	.	
STANDRD PLATE CNT MF (CT/ML)		DET'N LIMIT = 0		GUIDELINE = 500/ML (A1)
JAN	2	0	TAN	
FEB	4	4	6	
MAR	4	5	1	
APR	0	1	1	
MAY	10	11	6	
JUN	0	5	0	
JUL	11	2	3	
AUG	9	43	36	
SEP	.	.	3 <=>	
OCT	.	.	0 <=>	
NOV	.	.	0 <=>	
DEC	.	.	4 <=>	
P/A BOTTLE (0=ABSENT)		DET'N LIMIT = 0		GUIDELINE = 0 (A1*)
JAN	.	.	0	
FEB	.	.	0	
MAR	.	.	0	
APR	.	.	0	
MAY	.	.	0	
JUN	.	.	0	
JUL	.	.	0	
AUG	.	.	0	
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 5/100ML(A1)
JAN	0	0	0	
FEB	0	0	0	
MAR	0	0	0	
APR	0	0	0	
MAY	0	0	0	
JUN	BDL	BDL	0	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
JUL	0	0	0
AUG	0	0	0
SEP	BDL	BDL	0 T06
OCT	0 T24	0 T24	0 T24
NOV	0 T48	0 T24	0 T24
DEC	0 T06	0 T06	0 T06
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = N/A
JAN	0	0	0
FEB	0	0	0
MAR	0	0	0
APR	0	0	0
MAY	0	0	0
JUN	4	BDL	0
JUL	0	0	0
AUG	0	0	0
SEP	BDL	BDL	0 T06
OCT	0 T24	0 T24	0 T24
NOV	0 T48	0 T24	0 T24
DEC	0 T06	0 T06	0 T06

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
CHEMISTRY (FLD)				
FLD CHLORINE (COMB) (MG/L)		DET'N LIMIT = N/A		GUIDELINE = N/A
JAN	.	.	.700	
FEB	.	.	.200	
MAR	.	.	.200	
APR	.	.	.100	
JUN	.	.	.200	
AUG	.	.	.100	
OCT	.	.	.100	
NOV	.	.	.300	
DEC	.	.	.200	
FLD CHLORINE FREE (MG/L)		DET'N LIMIT = N/A		GUIDELINE = N/A
JAN	.	.	8.000	
FEB	.	.	.700	
MAR	.	.	.900	
APR	.	.	1.200	
MAY	.	.	.900	
JUN	.	.	1.100	
JUL	.	.	.900	
AUG	.	.	.900	
SEP	.	.	1.200	
OCT	.	.	1.100	
NOV	.	.	.900	
DEC	.	.	.900	
FLD CHLORINE (TOTAL) (MG/L)		DET'N LIMIT = N/A		GUIDELINE = N/A
JAN	.	.	1.300	
FEB	.	.	.900	
MAR	.	.	1.100	
APR	.	.	1.300	
MAY	.	.	.900	
JUN	.	.	1.300	
JUL	.	.	.900	
AUG	.	.	1.000	
SEP	.	.	1.200	
OCT	.	.	1.200	
NOV	.	.	1.200	
DEC	.	.	1.100	
FLD PH (DIMENSIONLESS)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)
JAN	7.300	7.200	7.300	
FEB	7.200	7.200	7.400	
MAR	7.500	7.500	7.500	
APR	7.500	7.500	7.700	
MAY	7.500	7.500	7.500	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
JUN	7.500	7.500	7.500	
JUL	7.500	7.500	7.500	
AUG	7.500	7.500	7.500	
SEP	7.600	7.500	7.600	
OCT	7.500	7.500	7.500	
NOV	7.500	7.500	7.500	
DEC	7.500	7.500	7.500	
FLD TEMPERATURE (DEG.C)		DET'N LIMIT = N/A		GUIDELINE = 15 (A1)
JAN	9.000	9.000	9.500	
FEB	9.000	9.000	9.000	
MAR	8.000	8.000	8.000	
APR	8.100	8.100	8.700	
MAY	8.100	8.500	9.000	
JUN	8.100	8.100	8.000	
JUL	8.100	8.700	9.000	
AUG	8.000	9.000	9.000	
SEP	8.100	9.000	9.000	
OCT	8.000	8.800	9.000	
NOV	8.000	8.900	8.500	
DEC	8.000	9.000	8.500	
FLD TURBIDITY (FTU)		DET'N LIMIT = N/A		GUIDELINE = 1.0 (A1)
JAN	.	.100	.100	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
	CHEMISTRY (LAB)			
ALKALINITY (MG/L)		DET'N LIMIT = .200		GUIDELINE = 30-500 (A4)
JAN	224.300	233.100	229.400	
FEB	225.200	228.400	228.400	
MAR	230.200	234.800	230.400	
APR	234.900	223.000	234.700	
MAY	231.700	233.800	233.600	
JUN	228.800	221.000	223.400	
JUL	231.600	239.700	232.500	
AUG	227.800	235.300	231.300	
SEP	230.200	238.600	218.200	
OCT	232.900	241.100	236.500	
NOV	228.700	238.600	233.900	
DEC	231.400	241.800	235.900	
CALCIUM (MG/L)		DET'N LIMIT = .100		GUIDELINE = 100 (F2)
JAN	81.400	80.000	82.600	
FEB	83.200	90.400	87.000	
MAR	79.200	90.400	84.800	
APR	76.400	80.200	81.400	
MAY	79.200	84.600	81.200	
JUN	79.800	61.800	61.600	
JUL	81.800	81.400	82.400	
AUG	87.000	91.200	95.600	
SEP	84.600	87.000	89.800	
OCT	77.600	83.000	84.000	
NOV	78.800	87.600	85.800	
DEC	80.000	86.000	80.400	
CHLORIDE (MG/L)		DET'N LIMIT = .200		GUIDELINE = 250 (A3)
JAN	5.100	21.000	14.600	
FEB	5.000	19.900	14.300	
MAR	5.200	20.400	14.500	
APR	5.300	19.500	14.100	
MAY	5.200	22.900	16.800	
JUN	5.400	18.900	14.600	
JUL	5.600	21.300	14.900	
AUG	4.800	22.900	14.600	
SEP	5.500	21.000	15.600	
OCT	4.500	19.700	15.100	
NOV	5.600	21.300	15.700	
DEC	6.000	20.700	15.200	
COLOUR (TCU)		DET'N LIMIT = .5		GUIDELINE = 5.0 (A3)
JAN	BDL	BDL	BDL	
FEB	BDL	BDL	BDL	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
MAR	BDL	BDL	BDL
APR	1.000 <T	.500 <T	3.500
MAY	1.000 <T	.500 <T	.500 <T
JUN	1.000 <T	.500 <T	BDL
JUL	.500 <T	.500 <T	BDL
AUG	.500 <T	BDL	BDL
SEP	.500 <T	BDL	BDL
OCT	1.000 <T	.500 <T	.500 <T
NOV	.500 <T	BDL	BDL
DEC	.500 <T	.500 <T	BDL
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1	GUIDELINE = 400 (F2)
JAN	497	572	542
FEB	498	552	533
MAR	491	548	528
APR	527	535	534
MAY	506	562	543
JUN	504	535	525
JUL	507	570	539
AUG	505	573	542
SEP	500	564	538
OCT	497	561	537
NOV	502	571	544
DEC	499	562	537
FLUORIDE (MG/L)		DET'N LIMIT = .01	GUIDELINE = 2.400 (A1)
JAN	.040 <T	.040 <T	.020 <T
FEB	.020 <T	.040 <T	.040 <T
MAR	.040 <T	.050	.060
APR	.050	.040 <T	.040 <T
MAY	.050	.040 <T	.050
JUN	.050	.040 <T	.050
JUL	.050	.050	.050
AUG	.060	.050	.060
SEP	.060	.060	.060
OCT	.060	.040 <T	.060
NOV	.060	.060	.060
DEC	.060	.060	.060
HARDNESS (MG/L)		DET'N LIMIT = .500	GUIDELINE = 80-100 (A4)
JAN	267.000	267.000	271.000
FEB	271.000	293.000	282.000
MAR	261.000	294.000	278.000
APR	254.000	268.000	266.000
MAY	259.000	277.000	266.000
JUN	260.000	219.000	217.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
JUL	269.000	272.000	272.000
AUG	284.000	299.000	307.000
SEP	275.000	283.000	290.000
OCT	255.000	271.000	274.000
NOV	259.000	288.000	281.000
DEC	262.000	280.000	264.000
IONCAL (DMSNLESS)		DET'N LIMIT = N/A	GUIDELINE = N/A
JAN	.000 NAF	.000 NAF	.000 NAF
FEB	.000 NAF	.000 NAF	.000 NAF
MAR	.000 NAF	.000 NAF	.000 NAF
APR	.000 NAF	.000 NAF	.000 NAF
MAY	.000 NAF	.000 NAF	.000 NAF
JUN	.000 NAF	.000 NAF	.000 NAF
JUL	3.372	8.195	4.361
AUG	4.372	1.910	8.385
SEP	1.169	3.101	7.495
OCT	6.608	6.925	4.731
NOV	3.232	.479	.893
DEC	3.521	3.950	6.172
LANGELIERS INDEX (DMSNLESS)		DET'N LIMIT = N/A	GUIDELINE = N/A
JAN	1.021 NAF	.943 NAF	.973 NAF
FEB	.982 NAF	.939 NAF	.984 NAF
MAR	1.001 NAF	1.031 NAF	.937 NAF
APR	1.221 NAF	.968 NAF	1.217 NAF
MAY	1.032 NAF	1.079 NAF	1.073 NAF
JUN	1.170 NAF	.821 NAF	.935 NAF
JUL	1.046	1.033	1.068
AUG	.896	.904	.950
SEP	1.099	1.080	1.118
OCT	1.147	1.124	1.174
NOV	.805	.932	.867
DEC	.977	1.061	1.014
MAGNESIUM (MG/L)		DET'N LIMIT = .050	GUIDELINE = 30 (F2)
JAN	15.500	16.500	15.900
FEB	15.300	16.400	15.900
MAR	15.500	16.500	16.100
APR	15.200	16.300	15.400
MAY	15.000	15.900	15.400
JUN	14.800	15.900	15.500
JUL	15.600	16.700	16.100
AUG	16.200	17.300	16.600
SEP	15.500	16.000	16.100
OCT	14.900	15.600	15.600

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
NOV	15.000	16.700	16.200	
DEC	15.100	15.800	15.400	
SODIUM (MG/L)		DET'N LIMIT = .200		GUIDELINE = 200 (C3)
JAN	2.800	7.800	5.400	
FEB	2.400	7.400	5.400	
MAR	2.600	8.000	5.200	
APR	1.800	6.800	5.600	
MAY	2.600	7.600	5.600	
JUN	2.000	6.600	5.200	
JUL	2.400	7.600	5.600	
AUG	2.800	7.800	5.600	
SEP	3.000	7.600	5.600	
OCT	2.800	7.600	5.800	
NOV	2.800	8.200	6.000	
DEC	2.800	8.000	5.600	
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = .05 (F2)
JAN	.016	.004 <T	BDL	
FEB	.006 <T	.002 <T	.002 <T	
MAR	.008 <T	.014	BDL	
APR	.002	.006 <T	BDL	
MAY	.016	.014	.010	
JUN	.010	.008 <T	.004 <T	
JUL	.002 <T	.006 <T	BDL	
AUG	BDL	.010	.002 <T	
SEP	.012	.008 <T	.006 <T	
OCT	.002	.006	.002	
NOV	.004 <T	.004 <T	.002 <T	
DEC	.012	.010	.010	
NITRITE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)
JAN	.014	BDL	BDL	
FEB	.001 <T	.001 <T	BDL	
MAR	.006	.009	BDL	
APR	.002	.002 <T	BDL	
MAY	.002 <T	.001 <T	BDL	
JUN	.001 <T	.001 <T	BDL	
JUL	.001 <T	.001 <T	BDL	
AUG	.002 <T	.002 <T	BDL	
SEP	.007	.005	BDL	
OCT	.010	.013	BDL	
NOV	.005	.005	.001 <T	
DEC	.005	.004 <T	.001 <T	
TOTAL NITRATES (MG/L)		DET'N LIMIT = .020		GUIDELINE = 10.000 (A1)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
JAN	2.300	2.110	2.270	
FEB	2.350	1.990	2.190	
MAR	2.280	2.160	2.210	
APR	2.590	2.020	2.270	
MAY	2.330	2.340	2.420	
JUN	2.380	1.840	2.020	
JUL	2.520	2.160	2.250	
AUG	2.540	2.320	2.250	
SEP	2.080	1.880	2.120	
OCT	2.140	1.720	1.830	
NOV	2.300	1.990	2.170	
DEC	2.310	1.960	2.130	
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = .020		GUIDELINE = N/A
JAN	.050 <T	.050 <T	.030 <T	
FEB	.050 <T	.050 <T	.040 <T	
MAR	.050 <T	.070 <T	.030 <T	
APR	.080 <T	.060 <T	.060 <T	
MAY	.060 <T	.080 <T	.050 <T	
JUN	.090 <T	.060 <T	.060 <T	
JUL	.070 <T	.060 <T	.060 <T	
AUG	.110	.120	.090 <T	
SEP	.090 <T	.100	.080 <T	
OCT	.060 <T	.070 <T	.030 <T	
NOV	.090 <T	.070 <T	.050 <T	
DEC	.080 <T	.070 <T	.050 <T	
PH (DMSNLESS)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)
JAN	8.220	8.140	8.160	
FEB	8.170	8.090	8.150	
MAR	8.200	8.170	8.110	
APR	8.430	8.180	8.400	
MAY	8.230	8.250	8.260	
JUN	8.370	8.150	8.260	
JUL	8.230	8.210	8.250	
AUG	8.060	8.040	8.070	
SEP	8.270	8.230	8.290	
OCT	8.350	8.290	8.340	
NOV	8.010	8.080	8.030	
DEC	8.170	8.210	8.200	
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = .0005		GUIDELINE = N/A
JAN	.001 <T	BDL	.000 <T	
FEB	.000 <T	.000 <T	.001 <T	
MAR	.001 <T	.001 <T	.002	
APR	.001	.000 <T	.001 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
MAY	.003 RVU	.002 <T	BDL	
JUN	.002 <T	.001 <T	.002 <T	
JUL	.002 <T	.000 <T	.001 <T	
AUG	BDL	BDL	.001 <T	
SEP	.003	.001 <T	.002 <T	
OCT	.001 <T	.001 <T	.001 <T	
NOV	.002 <T	.001 <T	.002 <T	
DEC	.001 <T	.001 <T	.001 <T	
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = .002		GUIDELINE = .40 (F2)
JAN	.002 <T	BDL	BDL	
FEB	.003 <T	BDL	BDL	
MAR	BDL	BDL	BDL	
APR	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	.006 <T	
AUG	BDL	BDL	BDL	
SEP	BDL	BDL	BDL	
OCT	.002 <T	.002 <T	.002 <T	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	
SULPHATE (MG/L)		DET'N LIMIT = .200		GUIDELINE = 500. (A3)
JUL	33.000	33.300	33.590	
AUG	32.830	32.740	33.190	
SEP	31.600	32.600	32.400	
OCT	30.230	31.550	34.300	
NOV	27.200	29.770	31.480	
DEC	28.160	29.670	27.290	
TURBIDITY (FTU)		DET'N LIMIT = .02		GUIDELINE = 1.00 (A1)
JAN	.030 <T	.100 <T	.050 <T	
FEB	.070 <T	.130	.110	
MAR	.070 <T	.120	.050 <T	
APR	.100	.070 <T	.130	
MAY	.140	.040	.220	
JUN	.020 <T	.110	.090 <T	
JUL	.130	.380	.140	
AUG	.170	.120	.440	
SEP	.720	.780	.870	
OCT	.520	.590	.500	
NOV	.520	.510	.210 <T	
DEC	.040 <T	.220 <T	.170 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
METALS				
SILVER (UG/L)		DET'N LIMIT = .020		GUIDELINE = 50. (A1)
JAN	BDL	BDL	BDL	
FEB	.040 <T	.040 <T	.020 <T	
MAR	BDL	.020 <T	.030 <T	
APR	.050 <T	.080 <T	.070 <T	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	.050 <T	BDL	
AUG	BDL	BDL	BDL	
SEP	.030 <T	.060 <T	BDL	
OCT	BDL	BDL	.230 <T	
NOV	BDL	.030 <T	.130 <T	
DEC	BDL	BDL	BDL	
ALUMINUM (UG/L)		DET'N LIMIT = .050		GUIDELINE = 100.(A4)
JAN	5.100	5.000	5.000	
FEB	6.200	6.400	6.300	
MAR	1.300	1.500	1.300	
APR	3.100	2.900	3.200	
MAY	3.000	3.600	2.900	
JUN	9.000	12.000	9.300	
JUL	2.300	3.800	2.900	
AUG	2.600	6.300	3.700	
SEP	6.200	6.500	6.200	
OCT	2.100	2.000	1.600	
NOV	3.400	3.500	4.100	
DEC	4.700	6.200	4.200	
ARSENIC (UG/L)		DET'N LIMIT = 0.050		GUIDELINE = 50.0 (A1)
JAN	BDL	.170 <T	.100 <T	
FEB	BDL	BDL	BDL	
MAR	.080 <T	.180 <T	.100 <T	
APR	BDL	BDL	BDL	
MAY	BDL	.450 <T	.200 <T	
JUN	BDL	BDL	.160 <T	
JUL	BDL	BDL	BDL	
AUG	.080 <T	.280 <T	.080 <T	
SEP	.070 <T	.480 <T	.190 <T	
OCT	.210 <T	.480 <T	.230 <T	
NOV	.070 <T	.080 <T	.130 <T	
DEC	.270 <T	.250 <T	.150 <T	
BARIUM (UG/L)		DET'N LIMIT = 0.020		GUIDELINE = 1000. (A1)
JAN	57.000	65.000	60.000	
FEB	57.000	62.000	63.000	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
MAR	58.000	64.000	65.000
APR	68.000	73.000	76.000
MAY	64.000	70.000	71.000
JUN	76.000	92.000	84.000
JUL	66.000	71.000	70.000
AUG	8.800	73.000	70.000
SEP	72.000	79.000	71.000
OCT	69.000	76.000	75.000
NOV	70.000	75.000	75.000
DEC	67.000	80.000	11.000
BORON (UG/L)		DET'N LIMIT = 0.200	GUIDELINE = 5000. (A1)
JAN	4.700 <T	7.000 <T	11.000 <T
FEB	4.700 <T	6.800 <T	6.200 <T
MAR	5.500 <T	7.700 <T	8.000 <T
APR	7.000 <T	8.200 <T	10.000 <T
MAY	3.100 <T	4.400 <T	3.900 <T
JUN	27.000	21.000	6.800 <T
JUL	5.200 <T	7.200 <T	6.200 <T
AUG	7.100 <T	7.500 <T	6.600 <T
SEP	100.000	76.000	89.000
OCT	32.000	33.000	22.000
NOV	64.000	18.000 <T	60.000
DEC	100.000	86.000	18.000 <T
BERYLLIUM (UG/L)		DET'N LIMIT = 0.010	GUIDELINE = .20 (H)
JAN	BDL	BDL	BDL
FEB	.020 <T	.030 <T	.020 <T
MAR	BDL	.010 <T	.010 <T
APR	.050 <T	BDL	BDL
MAY	BDL	BDL	BDL
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	.030 <T	BDL	BDL
SEP	.220 <T	.150 <T	.130 <T
OCT	.080 <T	.040 <T	.080 <T
NOV	.100 <T	.040 <T	.190 <T
DEC	.180 <T	.130 <T	.080 <T
CADMIUM (UG/L)		DET'N LIMIT = 0.050	GUIDELINE = 5.000 (A1)
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	BDL	BDL
APR	BDL	BDL	BDL
MAY	BDL	BDL	BDL
JUN	BDL	.070 <T	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
JUL	BDL	BDL	BDL
AUG	BDL	BDL	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	.080 <T	BDL
COBALT (UG/L)		DET'N LIMIT = 0.020	GUIDELINE = 1000 (H)
JAN	.260 <T	.260 <T	.120 <T
FEB	BDL	BDL	BDL
MAR	.380 <T	.470 <T	.140 <T
APR	.050 <T	BDL	BDL
MAY	.230 <T	.190 <T	.100 <T
JUN	.030 <T	BDL	.170 <T
JUL	BDL	BDL	BDL
AUG	.060 <T	BDL	BDL
SEP	.380 <T	.320 <T	.280 <T
OCT	.290 <T	.200 <T	.130 <T
NOV	.050 <T	.100 <T	.210 <T
DEC	.160 <T	.220 <T	.050 <T
CHROMIUM (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 50. (A1)
JAN	.180 <T	.170 <T	1.500
FEB	.270 <T	.260 <T	.290 <T
MAR	.590 <T	.320 <T	1.300
APR	1.200	.870 <T	1.600
MAY	.160 <T	.150 <T	.150 <T
JUN	2.500	1.700	.270 <T
JUL	.200 <T	.200 <T	.130 <T
AUG	.340 <T	BDL	.250 <T
SEP	10.000	7.200	9.900
OCT	12.000	11.000	8.700
NOV	7.100	1.400	6.000
DEC	9.300	7.600	1.000 <T
COPPER (UG/L)		DET'N LIMIT = .100	GUIDELINE = 1000 (A3)
JAN	.220 <T	.350 <T	.110 <T
FEB	.220 <T	.370 <T	.400 <T
MAR	.230 <T	.410 <T	.360 <T
APR	.360 <T	.420 <T	.400 <T
MAY	.580 <T	.360 <T	.480 <T
JUN	.350 <T	.700 <T	.530 <T
JUL	.240 <T	.580 <T	.580 <T
AUG	7.600	.550 <T	.470 <T
SEP	.290 <T	.630 <T	.690 <T
OCT	.170 <T	.530 <T	2.800

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
NOV	.370 <T	.510 <T	.510 <T
DEC	.350 <T	1.000 <T	8.700
IRON (UG/L)		**DET'N LIMIT = 4.000**	**GUIDELINE = 300. (A3)**
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	BDL	6.600 <T
APR	12.000 <T	4.900 <T	14.000 <T
MAY	BDL	BDL	BDL
JUN	5.600 <T	16.000 <T	6.200 <T
JUL	BDL	BDL	BDL
AUG	BDL	BDL	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL
MERCURY (UG/L)		**DET'N LIMIT = 0.010**	**GUIDELINE = 1.000 (A1)**
JAN	.020	.020	.020
FEB	.020	.020	.020
MAR	.020	.030	.030
APR	.030	.030	.030
MAY	.040 <T	.020 <T	.030 <T
JUN	.020 <T	BDL	.020 <T
JUL	BDL	BDL	BDL
AUG	BDL	BDL	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	.020 <T	BDL
DEC	BDL	BDL	BDL
MANGANESE (UG/L)		**DET'N LIMIT = .050**	**GUIDELINE = 50.0 (A3)**
JAN	.540	.520	.110 <T
FEB	.540	.560	.540
MAR	.610	.580	.570
APR	.590	.640	.630
MAY	.350 <T	.340 <T	.320 <T
JUN	.690	7.600	1.300
JUL	.380 <T	.350 <T	.400 <T
AUG	BDL	.350 <T	.400 <T
SEP	.550	.750	.880
OCT	.510	.900	.640
NOV	.550	.710	.800
DEC	.600	1.400	.090 <T
MOLYBDENUM (UG/L)		**DET'N LIMIT = 0.020**	**GUIDELINE = 500 (H)**

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
JAN	.490 <T	.390 <T	.510	
FEB	.500	.410 <T	.470 <T	
MAR	.540	.410 <T	.520	
APR	.600	.450 <T	.560	
MAY	.550	.410 <T	.460 <T	
JUN	.530	.450 <T	.490 <T	
JUL	.580	.410 <T	.480 <T	
AUG	.660	.410 <T	.490 <T	
SEP	.770	.560	.480 <T	
OCT	.570	.450 <T	.510	
NOV	.490 <T	.500 <T	.470 <T	
DEC	.500 <T	.440 <T	.730	
NICKEL (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 50. (F3)
JAN	1.720	2.300	.940 <T	
FEB	BDL	BDL	BDL	
MAR	1.200 <T	2.500	.420 <T	
APR	BDL	BDL	BDL	
MAY	.320 <T	.360 <T	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	BDL	
AUG	BDL	BDL	BDL	
SEP	BDL	BDL	BDL	
OCT	1.700 <T	1.700 <T	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	.210 <T	BDL	
LEAD (UG/L)		DET'N LIMIT = 0.050		GUIDELINE = 50. (A1)
JAN	.040 <T	.050 <T	.020 <T	
FEB	BDL	.040 <T	BDL	
MAR	.030 <T	.040 <T	.040 <T	
APR	.090 <T	.080 <T	.050 <T	
MAY	.050 <T	.040 <T	BDL	
JUN	BDL	.070 <T	.070 <T	
JUL	BDL	BDL	.030 <T	
AUG	.030 <T	.070 <T	BDL	
SEP	.060 <T	.060 <T	.030 <T	
OCT	BDL	.030 <T	.030 <T	
NOV	.050 <T	BDL	.110 <T	
DEC	BDL	.040 <T	BDL	
ANTIMONY (UG/L)		DET'N LIMIT = .050		GUIDELINE = 146. (D4)
JAN	BDL	.020 <T	BDL	
FEB	BDL	.040 <T	BDL	
MAR	.020 <T	.020 <T	.020 <T	
APR	.050 <T	.040 <T	.070 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
MAY	BDL	BDL	BDL
JUN	BDL	.030 <T	BDL
JUL	.030 <T	.030 <T	BDL
AUG	.650	.330	.300
SEP	.520	.520	.390
OCT	BDL	BDL	.040 <T
NOV	.390	.350	.350
DEC	.250	.220	.470
SELENIUM (UG/L)		DET'N LIMIT = 0.200	GUIDELINE = 10. (A1)
JAN	BDL	BDL	.880 <T
FEB	.600 <T	.630 <T	1.100 <T
MAR	1.100 <T	1.400 <T	1.400 <T
APR	.320 <T	1.100 <T	1.200 <T
MAY	1.100 <T	2.400 <T	2.200 <T
JUN	1.500 <T	.560 <T	1.900 <T
JUL	BDL	.220 <T	BDL
AUG	1.200 <T	.390 <T	1.200 <T
SEP	BDL	1.500 <T	1.500 <T
OCT	BDL	BDL	.690 <T
NOV	1.300 <T	2.300 <T	3.600 <T
DEC	1.000 <T	1.500 <T	.340 <T
STRONTIUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = 2000.(H)
JAN	150.000	180.000	170.000
FEB	160.000	170.000	170.000
MAR	160.000	180.000	170.000
APR	170.000	190.000	190.000
MAY	170.000	190.000	190.000
JUN	180.000	200.000	190.000
JUL	150.000	170.000	160.000
AUG	16.000	170.000	150.000
SEP	180.000	200.000	180.000
OCT	170.000	180.000	180.000
NOV	160.000	170.000	180.000
DEC	170.000	190.000	2..000
TITANIUM (UG/L)		DET'N LIMIT = .050	GUIDELINE = N/A
JAN	18.000	17.000	14.000
FEB	19.000	19.000	20.000
MAR	29.000	29.000	25.000
APR	16.000	16.000	15.000
MAY	17.000	17.000	16.000
JUN	19.000	19.000	18.000
JUL	20.000	19.000	19.000
AUG	5.800	14.000	13.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
SEP	18.000	20.000	20.000	
OCT	11.000	11.000	9.000	
NOV	22.000	22.000	20.000	
DEC	12.000	13.000	5.200	
THALLIUM (UG/L)		DET'N LIMIT = .010		GUIDELINE = 13. (D4)
JAN	.010 <T	.010 <T	BDL	
FEB	.010 <T	.030 <T	.010 <T	
MAR	.010 <T	.010 <T	BDL	
APR	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	
JUN	.020 <T	BDL	BDL	
JUL	BDL	BDL	.020 <T	
AUG	BDL	BDL	BDL	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	.020 <T	
NOV	BDL	BDL	BDL	
DEC	.020 <T	.020 <T	.020 <T	
URANIUM (UG/L)		DET'N LIMIT = .020		GUIDELINE = 20. (A2)
JAN	2.600	2.200	2.200	
FEB	2.500	2.200	2.400	
MAR	2.300	2.000	2.200	
APR	2.700	2.300	2.700	
MAY	2.400	2.400	2.500	
JUN	3.400	2.700	3.000	
JUL	3.100	2.600	2.800	
AUG	.630	2.500	2.700	
SEP	2.700	2.400	2.500	
OCT	2.600	2.300	2.600	
NOV	2.600	2.400	2.500	
DEC	2.700	2.000	1.500	
VANADIUM (UG/L)		DET'N LIMIT = .050		GUIDELINE = 100 (H)
JAN	.100 <T	.150 <T	.160 <T	
FEB	.080 <T	.070 <T	.090 <T	
MAR	.110 <T	.100 <T	.100 <T	
APR	.130 <T	.110 <T	.070 <T	
MAY	.100 <T	.140 <T	.120 <T	
JUN	.130 <T	.140 <T	.100 <T	
JUL	.120 <T	.200 <T	.160 <T	
AUG	.100 <T	.070 <T	.110 <T	
SEP	.120 <T	.190 <T	.130 <T	
OCT	.170 <T	.370 <T	.220 <T	
NOV	.110 <T	.140 <T	.150 <T	
DEC	.140 <T	.180 <T	.160 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
ZINC (UG/L)		DET'N LIMIT = .001	GUIDELINE = 5.00 (A3)
JAN	.540 <T	.840 <T	.690 <T
FEB	.540 <T	.840 <T	.640 <T
MAR	1.200	1.300	1.100
APR	1.300	1.300	1.000 <T
MAY	1.700	1.300	1.600
JUN	1.200	1.400	1.200
JUL	1.700	2.000	1.700
AUG	.760 <T	1.200	.930 <T
SEP	1.200	1.500	1.600
OCT	.580 <T	.480 <T	.620 <T
NOV	1.400	1.200	1.100
DEC	.740 <T	1.100	.710 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

PHENOLICS (UG/L)	RAW 6	RAW 5	TREATED
	PHENOLICS		
		DET'N LIMIT = 0.2	GUIDELINE = 2.00 (A3)
JAN	BDL	BDL	BDL
FEB	.600 <T	.600 <T	.600 <T
MAR	BDL	BDL	BDL
APR	BDL	BDL	BDL
MAY	.200 <T	1.000 <T	.200
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	.200 <T	.200 <T	.400 <T
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	.600 <T	.600 <T	.600 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED	
VOLATILES				
TOLUENE (UG/L)		DET'N LIMIT = .050		GUIDELINE = 24.0 (B4)
JAN	ISM	ISM	ISM	
MAR	IAW	IAW	ISM	
APR	BDL	.100 <T	BDL	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	.100 <T	BDL	
AUG	BDL	BDL	BDL	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	.050 <T	BDL	BDL	
DEC	BDL	BDL	BDL	
ETHYLBENZENE (UG/L)		DET'N LIMIT = .050		GUIDELINE = 2.4 (B4)
JAN	ISM	ISM	ISM	
MAR	IAW	IAW	ISM	
APR	BDL	BDL	BDL	
MAY	.050 <T	.050 <T	.050 <T	
JUN	.100 <T	BDL	.050 <T	
JUL	.150 <T	.150 <T	.100 <T	
AUG	.150 <T	.050 <T	.100 <T	
SEP	.050 <T	BDL	.050 <T	
OCT	.050 <T	.050 <T	.050 <T	
NOV	.050 <T	BDL	BDL	
DEC	BDL	BDL	BDL	
M-XYLENE (UG/L)		DET'N LIMIT = .100		GUIDELINE = 300 (B4)
JAN	ISM	ISM	ISM	
MAR	IAW	IAW	ISM	
APR	BDL	BDL	BDL	
MAY	BDL	.100 <T	BDL	
JUN	BDL	BDL	.100 <T	
JUL	BDL	BDL	BDL	
AUG	.200 <T	BDL	.100 <T	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	
O-XYLENE (UG/L)		DET'N LIMIT = .050		GUIDELINE = 300 (B4)
JAN	ISM	ISM	ISM	
MAR	IAW	IAW	ISM	
APR	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	.100 <T	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
JUL	.050 <T	BDL	BDL
AUG	BDL	BDL	.050 <T
SEP	BDL	BDL	.050 <T
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL
STYRENE (UG/L)		DET'N LIMIT = .050	GUIDELINE = 46.5 (D2)
OCT	.450 <T	.300 <T	BDL
NOV	.500 <T	.350 <T	BDL
DEC	.050 <T	.200 <T	BDL
CHLOROFORM (UG/L)		DET'N LIMIT = .100	GUIDELINE = 350 (A1+)
JAN	ISM	ISM	ISM
MAR	IAV	IAV	ISM
APR	BDL	BDL	14.400
MAY	BDL	BDL	6.500
JUN	BDL	BDL	11.100
JUL	.100 <T	BDL	3.900
AUG	BDL	BDL	4.600
SEP	BDL	BDL	6.900
OCT	BDL	BDL	7.600
NOV	BDL	BDL	4.400
DEC	BDL	BDL	5.900
111, TRICHLOROETHANE (UG/L)		DET'N LIMIT = .020	GUIDELINE = 200 (D1)
JAN	ISM	ISM	ISM
MAR	IAV	IAV	ISM
APR	BDL	BDL	BDL
MAY	.160 <T	BDL	BDL
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	BDL	BDL	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = .050	GUIDELINE = 350 (A1+)
JAN	ISM	ISM	ISM
MAR	IAV	IAV	ISM
APR	BDL	BDL	8.700
MAY	BDL	BDL	5.300
JUN	BDL	BDL	5.700
JUL	.100 <T	BDL	4.500

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
AUG	BDL	BDL	5.600
SEP	BDL	BDL	4.850
OCT	BDL	BDL	4.450
NOV	BDL	BDL	4.400
DEC	BDL	BDL	5.250

CHLORODIBROMOMETHANE (UG/L) DET'N LIMIT = .100 GUIDELINE = 350 (A1+)

JAN	ISM	ISM	ISM
MAR	IAW	IAW	ISM
APR	BDL	BDL	4.400
MAY	BDL	BDL	6.900
JUN	BDL	BDL	6.200
JUL	BDL	BDL	2.700
AUG	BDL	BDL	6.300
SEP	BDL	BDL	5.700
OCT	BDL	BDL	6.700
NOV	BDL	BDL	5.500
DEC	BDL	BDL	6.200

T-CHLOROETHYLENE (UG/L) DET'N LIMIT = .050 GUIDELINE = 10.0 (C2)

JAN	ISM	ISM	ISM
MAR	IAW	IAW	ISM
APR	BDL	BDL	BDL
MAY	BDL	BDL	BDL
JUN	BDL	BDL	BDL
JUL	.050 <T	.150 <T	.300 <T
AUG	.450 <T	.350 <T	.650
SEP	.050 <T	.050 <T	.800
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL

BROMOFORM (UG/L) DET'N LIMIT = .200 GUIDELINE = 350 (A1+)

JAN	ISM	ISM	ISM
MAR	IAW	IAW	ISM
APR	BDL	BDL	.800 <T
MAY	BDL	BDL	1.000 <T
JUN	BDL	BDL	.600 <T
JUL	BDL	BDL	.600 <T
AUG	BDL	BDL	1.400 <T
SEP	BDL	BDL	1.400 <T
OCT	BDL	BDL	1.200 <T
NOV	BDL	BDL	1.400 <T
DEC	BDL	BDL	1.800 <T

TOTL TRIHALOMETHANES (UG/L) DET'N LIMIT = .500 GUIDELINE = 350 (A1)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STOUFFVILLE WELL SUPPLY 1988

	RAW 6	RAW 5	TREATED
JAN	ISM	ISM	ISM
MAR	IAW	IAW	ISM
APR	BDL	BDL	28.300
MAY	BDL	BDL	19.700
JUN	BDL	BDL	23.600
JUL	BDL	BDL	11.700
AUG	BDL	BDL	17.900
SEP	BDL	BDL	18.850
OCT	BDL	BDL	19.950
NOV	BDL	BDL	15.700
DEC	BDL	BDL	19.150

Table VI

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
STANDARD PLATE COUNT MEMBRANE FILTRATION	CT/ML	0	500/ML(A1)
P/A BOTTLE		0	0 (A1*)
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100mL(A1)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
CHLOROAROMATICS			
HEXACHLOROBUTADIENE	NG/L	1.000	450. (D4)
1,2,3-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,4-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.000	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.000	10000 (D4)
HEXACHLOROBENZENE	NG/L	1.0	10. (C1)
HEXACHLOROETHANE	NG/L	1.000	1900. (D4)
OCTACHLOROSTYRENE	NG/L	1.000	N/A
PENTACHLOROBENZENE	NG/L	1.000	74000 (D4)
2,3,6-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,6,A-TRICHLOROTOLUENE	NG/L	5.000	N/A
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	50.	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	50.	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	50.	N/A
2,4,5-TRICHLOROPHENOL	NG/L	50.	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	50.	5000. (B1)
PENTACHLOROPHENOL	NG/L	50.	60000. (B1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD PH	DIMENSLESS	N/A	6.5-8.5(A4)
FIELD TEMPERATURE	^{o}C	N/A	<15 ^{o}C(A1)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	.200	30-500(A4)
CALCIUM	MG/L	.100	100. (F2)
CYANIDE	MG/L	.001	.20(A1)
CHLORIDE	MG/L	.200	250. (A3)
COLOUR	TCU	.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.	400. (F2)
FLUORIDE	MG/L	.01	2.4 (A1)
HARDNESS	MG/L	.50	80-100(A4)
MAGNESIUM	MG/L	.05	30. (F2)
SODIUM	MG/L	.20	200. (C3)
AMMONIUM TOTAL	MG/L	.002	.05(F2)
NITRITE	MG/L	.001	1.0 (A1)
TOTAL NITRATES	MG/L	.02	10. (A1)
NITROGEN TOTAL KJELDAHL	MG/L	.02	N/A
PH	DIMENSLESS	N/A	6.5-8.5(A4)
PHOSPHORUS FIL REACT	MG/L	.0005	N/A
PHOSPHORUS TOTAL	MG/L	.002	.40(F2)
TOTAL SOLIDS	MG/L	1.	500. (A3)
TURBIDITY	FTU	.02	1.0 (A1)
METALS			

BORON	UG/L	.200	5000.	(A1)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
BERYLLIUM	UG/L	.010	0.20	(N)
CADMIUM	UG/L	.050	5.0	(A1)
COBALT	UG/L	.020	1000.	(N)
CHROMIUM	UG/L	.100	50.	(A1)
COPPER	UG/L	.100	1000.	(A3)
IRON	UG/L	4.0	300.	(A3)
MERCURY	UG/L	.01	1.0	(A1)
MANGANESE	UG/L	.050	50.	(A3)
MOLYBDENUM	UG/L	.020	500.	(N)
NICKEL	UG/L	.100	50.	(P3)
LEAD	UG/L	.050	50.	(A1)
SELENIUM	UG/L	.200	10.	(A1)
SILVER	UG/L	.020	50.	(A1)
STRONTIUM	UG/L	.050	2000.	(N)
THALLIUM	UG/L	.010	13.	(D4)
TITANIUM	UG/L	.050	N/A	
URANIUM	UG/L	.020	20.	(A2)
VANADIUM	UG/L	.050	100.	(N)
ZINC	UG/L	.020	500.	(A3)

PHENOLICS

PHENOLICS (UNFILTERED REACTIVE)	UG/L	.2	2.0	(A3)

PESTICIDES & PCB

ALDRIN	NG/L	1.0	700.	(A1)
AMETRINE	NG/L	50.	300000.	(D3)
ATRAZINE	NG/L	50.	60000.	(B3)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700.	(G)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300.	(G)
GAMMA HEXACHLOROCYCLOHEXANE(LINDANE)	NG/L	1.0	4000.	(A1)
ALPHA CHLORDANE	NG/L	2.0	7000.	(A1)
GAMMA CHLORDANE	NG/L	2.0	7000.	(A1)
BLADEX	NG/L	100.	10000.	(B3)
DIELDRIN	NG/L	2.0	700.	(A1)
METHOXYCHLOR	NG/L	5.0	100000.	(A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000.	(D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	4.0	74000.	(D4)
ENDRIN	NG/L	4.0	200.	(A1)
ENDOSULFAN SULPHATE(THIODAN SULPHATE)	NG/L	4.0	N/A	
HEPTACHLOR EPOXIDE	NG/L	1.0	3000.	(A1)
HEPTACHLOR	NG/L	1.0	3000.	(A1)
METOLACHLOR	NG/L	500.	50000.	(B3)
MIREX	NG/L	5.0	N/A	
OXYCHLORDANE	NG/L	2.0	N/A	
O,P-DDT	NG/L	5.0	30000.	(A1)
PCB	NG/L	20.0	3000.	(A2)
O,P-DDD	NG/L	5.0	N/A	
PPDDE	NG/L	1.0	30000.	(A1)
PPDDT	NG/L	5.0	30000.	(A1)
ATRATONE	NG/L	50.	N/A	
ALACHLOR	NG/L	500.	35000.	(D2)
PROMETONE	NG/L	50.	52500.	(D3)
PROPAZINE	NG/L	50.	16000.	(D2)
PROMETRYNE	NG/L	50.	1000.	(B3)
SENCOR (METRIBUZIN)	NG/L	100.	80000.	(B2)
SIMAZINE	NG/L	50.	10000.	(B3)

POLYAROMATIC HYDROCARBONS

PHENANTHRENE	NG/L	10.0	N/A	
ANTHRACENE	NG/L	1.0	N/A	
FLUORANTHENE	NG/L	20.0	42000.	(D4)
PYRENE	NG/L	20.0	N/A	
BENZO(A)ANTHRACENE	NG/L	20.0	N/A	
CHRYSENE	NG/L	50.0	N/A	
DIMETHYL BENZO(A)ANTHRACENE	NG/L	5.0	N/A	
BENZO(E)PYRENE	NG/L	50.0	N/A	
BENZO(B)FLUORANTHENE	NG/L	10.0	N/A	
PERYLENE	NG/L	10.0	N/A	
BENZO(K)FLUORANTHENE	NG/L	1.0	N/A	
BENZO(A)PYRENE	NG/L	5.0	10.	(B1)

BENZO(G,H,I)PERYLENE	NG/L	20.0	N/A

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
DIBENZO(A,H)ANTHRACENE	NG/L	10.0	N/A
INDENO(1,2,3-C,D)PYRENE	NG/L	20.0	N/A
BENZO(B)CHRYSENE	NG/L	2.0	N/A
CORONENE	NG/L	10.0	N/A
SPECIFIC PESTICIDES			
TOXAPHENE	NG/L	N/A	5000. (A1)
2,4,5-TRICHLOROBUTYRIC ACID	NG/L	50.	280000. (B1)
(2,4,5-T)			
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000. (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID	NG/L	200.	18000. (B3)
2,4-D PROPIONIC ACID	NG/L	100.	N/A
DICAMBA	NG/L	100.	87000. (B3)
PICHLORAM	NG/L	100.	2450000. (D3)
SILVEX (2,4,5-TP)	NG/L	50.	10000. (A1)
DIAZINON	NG/L	20.	14000. (A1)
DICHLORVOS	NG/L	20.	N/A
DURSBAN	NG/L	20.	N/A
ETHION	NG/L	20.	35000. (G)
GUTHION	NG/L	N/A	N/A
MALATHION	NG/L	20.	160000. (G)
MEVINPHOS	NG/L	20.	N/A
METHYL PARATHION	NG/L	50.	7000. (B3)
METHYLTRITHION	NG/L	20.	N/A
PARATHION	NG/L	20.	35000. (B1)
PHORATE (THIMET)	NG/L	20.	35. (D2)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
AMINOCARB	NG/L	N/A	N/A
BENOMYL	NG/L	N/A	N/A
BUX (METALKAMATE)	NG/L	2000.	N/A
CARBOFURAN	NG/L	2000.	18000. (D3)
CIPC (CHLORPROPHAM)	NG/L	2000.	350000. (G)
DIALLATE	NG/L	2000.	30000. (H)
EPTAM	NG/L	2000.	N/A
IPC	NG/L	2000.	N/A
PROPOXUR (BAYGON)	NG/L	2000.	90000. (G)
SEVIN (CARBARYL)	NG/L	200.	70000. (A1)
SUTAN (BUTYLATE)	NG/L	2000.	245000. (D3)
VOLATILES			
BENZENE	UG/L	.050	5.0 (B1)
TOLUENE	UG/L	.050	24.0 (B4)
ETHYLBENZENE	UG/L	.050	2.4 (B4)
PARA-XYLENE	UG/L	.100	300. (B4)
META-XYLENE	UG/L	.100	300. (B4)
ORTHO-XYLENE	UG/L	.050	300. (B4)
1,1-DICHLOROETHYLENE	UG/L	.100	7.0 (D1)
ETHLYENE DIBROMIDE	UG/L	.05	50. (G)
METHYLENE CHLORIDE	UG/L	.500	1750. (D3)
TRANS-1,2-DICHLOROETHYLENE	UG/L	.100	350. (D3)
1,1-DICHLOROETHANE	UG/L	.100	N/A
CHLOROFORM	UG/L	.100	350. (A1+)
1,1,1-TRICHLOROETHANE	UG/L	.020	200. (D1)
1,2-DICHLOROETHANE	UG/L	.050	5.0 (D1)
CARBON TETRACHLORIDE	UG/L	.200	5.0 (D1)
1,2-DICHLOROPROPANE	UG/L	.050	10.0 (G)
TRICHLOROETHYLENE	UG/L	.100	5.0 (D1)
DICHLOROBROMOMETHANE	UG/L	.050	350. (A1+)
1,1,2-TRICHLOROETHANE	UG/L	.050	.60(D4)
CHLORODIBROMOMETHANE	UG/L	.100	350. (A1+)
TETRACHLOROETHYLENE	UG/L	.050	10.0 (C2)
BROMOFORM	UG/L	.200	350. (A1+)
1,1,2,2-TETRACHLOROETHANE	UG/L	.050	0.17(D4)
CHLOROBENZENE	UG/L	.100	1510. (D3)
1,4-DICHLOROBENZENE	UG/L	.100	5.0 (B1)
1,3-DICHLOROBENZENE	UG/L	.100	130. (G)
1,2-DICHLOROBENZENE	UG/L	.050	200. (B1)
TRIFLUOROCHLOROTOLUENE	UG/L	.100	N/A
TOTAL TRIHALOMETHANES	UG/L	.500	350. (A1)
STYRENE	UG/L	.05	46.5 (D2)